

## **ABSTRACT**

A process and system for processing a thin film sample, as well as the thin film structure are provided. In particular, a beam generator can be controlled to emit successive irradiation beam pulses at a predetermined repetition rate. Each irradiation beam pulse may be masked to define a first plurality of beamlets and a second plurality of beamlets. The first and second plurality of beamlets of each of the irradiation pulses being provided for impinging the film sample and having an intensity which is sufficient to at least partially melt irradiated portions of the section of the film sample. A particular portion of the section of the film sample is irradiated with the first beamlets of a first pulse of the irradiated beam pulses to melt first areas of the particular portion, the first areas being at least partially melted, leaving first unirradiated regions between respective adjacent ones of the first areas, and being allowed to resolidify and crystallize. After the irradiation of the particular portion with the first beamlets, the particular portion is again irradiated with the second beamlets of a second pulse of the irradiated beam pulses to melt second areas of the particular portion, the second areas being at least partially melted, leaving second unirradiated regions between respective adjacent ones of the second areas, and being allowed to resolidify and crystallize. The first irradiated and re-solidified areas and the second irradiated and re-solidified areas are intermingled with one another within the section of the film sample. In addition, the first areas correspond to first pixels, and the second areas correspond to second pixels.